Amendments to the Claims

This listing of the Claims will replace all prior versions and listings of the claims in this patent application.

Listing of the Claims

1-46. (canceled)

47. (currently amended) A method of forming copper interconnects in the fabrication of an integrated circuit device comprising:

providing a substrate having a point of electrical contact in or on a surface of said substrate and having a first insulating layer overlying said substrate;

forming a first copper interconnect to said electrical contact through an opening in said first insulating layer wherein said first copper interconnect comprises a first single isolated via and an overlying first copper line ~~wherein said first single via is isolated from other vias formed through said first insulating layer and located elsewhere on said substrate~~; and

forming a first slot in said first copper line overlying said first single isolated via wherein said first slot is adjacent to an interface between said first single isolated via and said first copper line and wherein said first slot provides stress relief at said interface.

48. (currently amended) The method according to Claim 47 further comprising:

forming a second insulating layer overlying said first copper interconnect; and

forming a second copper interconnect through said second insulating layer to said first copper interconnect wherein said second copper interconnect comprises a second single isolated via and a second copper line overlying said second single isolated via ~~wherein said second single via is isolated from other vias formed through said second insulating layer elsewhere on said substrate~~.

49. (previously presented) The method according to Claim 47 wherein said first copper line has a width of more than about 0.2μm.

50. (previously presented) The method according to Claim 48 wherein said second copper line has a width of more than about 0.2μm.

51. (currently amended) The method according to Claim 48 wherein said first slot in said first copper line provides stress relief at the interface of said second single isolated via and said second copper line.

52. (currently amended) The method according to Claim 48 further comprising forming a second slot in said second copper line overlying said second single isolated via wherein said second slot is adjacent to an interface between said second single isolated via and said second copper line and wherein said second slot in said second copper line provides stress relief at said interface between said second single isolated via and said second copper line.

53. (currently amended) The method according to Claim 47 wherein said first slot comprises:

a first slot portion spaced a first distance from said first single isolated via in an X-direction;

a second slot portion spaced a second distance from said first single isolated via in an X-direction opposite from said X-direction of said first slot portion and having a same first Y-direction placement relative to said first isolated single via as said first slot portion; and

a third slot portion spaced a third distance from said first single isolated via in a second Y-direction placement different from said first Y-direction placement wherein said third slot portion contacts a section of said first slot portion and a section of said second slot portion thereby forming a single said first slot.

54. (previously presented) The method according to Claim 53 wherein said first, second, and third slot portions have a rectangular or square shape.

55. (currently amended) The method according to Claim 53 wherein a section of said first slot portion contacted by said third slot portion has a length defined ~~overlaps said first slot portion~~ by a fourth distance and wherein a section of said second slot portion contacted by said third slot portion has a length defined ~~overlaps said second slot portion~~ by a fifth distance.

56. (previously presented) The method according to Claim 53 wherein said first distance is between about 0.1 and 0.4 μm.

57. (previously presented) The method according to Claim 53 wherein said second distance is between about 0.1 and 0.4μm.

58. (previously presented) The method according to Claim 53 wherein said third distance is between about 0.05 and 0.3μm.

59. (previously presented) The method according to Claim 55 wherein said fourth distance is between about 0.1 and 0.5μm.

60. (previously presented) The method according to Claim 55 wherein said fifth distance is between about 0.1 and 0.5μm.

61. (previously presented) The method according to Claim 53 wherein said first slot portion has dimensions of between about 0.1 and 0.5μm by between about 0.5 and 1.0 μm.

62. (previously presented) The method according to Claim 53 wherein said second slot portion has dimensions of between about 0.1 and 0.5μm by between about 0.5 and 1.0 μm.

63. (previously presented) The method according to Claim 53 wherein said third slot portion has dimensions of between about 0.1 and 0.5μm by between about 0.9 and 1.5 μm.

64. (currently amended) The method according to Claim 52 wherein said second slot in said second copper line comprises:

a first slot portion spaced a first distance from said second single isolated via in an X-direction;

a second slot portion spaced a second distance from said second single isolated via in an X-direction opposite from said X-direction of said first slot portion and having a same first Y-direction placement relative to said second single isolated via as said first slot portion; and

a third slot portion spaced a third distance from said second single isolated via in a second Y-direction placement different from said first Y-direction placement wherein said third slot portion contacts a section of said first slot portion and a section of said second slot portion thereby forming a single said second slot.

65. (previously presented) The method according to Claim 64 wherein said first, second, and third slots portions have a rectangular or square shape.

66. (currently amended) The method according to Claim 64 wherein said section of said first slot portion contacted by said third slot portion ~~overlaps said first slot portion~~has a length defined by a fourth distance and wherein said section of said second slot portion contacted by said third slot portion ~~overlaps said second slot portion~~has a length defined by a fifth distance.

67. (previously presented) The method according to Claim 64 wherein said first distance is between about 0.1 and 0.4 μm, said second distance is between about 0.1 and 0.4μm, and said third distance is between about 0.05 and 0.3μm.

68. (previously presented) The method according to Claim 66 wherein said fourth distance is between about 0.1 and 0.5μm and said fifth distance is between about 0.1 and 0.5μm.

69. (previously presented) The method according to Claim 64 wherein said first slot portion has dimensions of between about 0.1 and 0.5μm by between about 0.5 and 1.0 μm, said second slot portion has dimensions of between about 0.1 and 0.5μm by between about 0.5 and 1.0 μm, and said third slot portion has dimensions of between about 0.1 and 0.5μm by between about 0.9 and 1.5 μm.

70. (currently amended) A method of forming copper interconnects in the fabrication of an integrated circuit device comprising:

providing a first copper line over a substrate;

forming an insulating layer overlying said first copper line;

forming a copper interconnect to said first copper line through an opening in said insulating layer wherein said copper interconnect comprises a single isolated via and an overlying second copper line ~~wherein said first single via is isolated from other vias formed through said insulating layer and located elsewhere on said substrate~~; and

forming a slot in at least one ~~or more~~ of said first copper line underlying said single isolated via and said second copper line overlying said single isolated via wherein

said slot is adjacent to an interface between said single isolated via and said at least one ~~or more~~ of said first and second copper lines wherein said slot provides stress relief at said interface.

71. (currently amended) The method according to Claim 70 wherein said slot comprises:

a first slot portion spaced a first distance from said first single isolated via in an X-direction;

a second slot portion spaced a second distance from said first single isolated via in an X-direction opposite from said X-direction of said first slot and having a same first Y-direction placement relative to said first single isolated via as said first slot portion; and

a third slot portion spaced a third distance from said first single isolated via in a second Y-direction placement different from said first Y-direction placement wherein said third slot portion contacts a section of said first slot portion and a section of said second slot portion thereby forming a single said slot.

72. (previously presented) The method according to Claim 71 wherein said first, second, and third slot portions have a rectangular or square shape.

73. (currently amended) The method according to Claim 71 wherein said section of said first slot portion contacted by said third slot portion ~~overlaps said first slot portion~~has a length defined by a fourth distance and wherein said section of said second slot portion contacted by said third slot portion ~~overlaps said second slot portion~~has a length defined by a fifth distance.

74. (previously presented) The method according to Claim 71 wherein said first distance is between about 0.1 and 0.4μm, said second distance is between about 0.1 and 0.4μm, and said third distance is between about 0.5 and 3.0μm.

75. (previously presented) The method according to Claim 73 wherein said fourth distance is between about 0.1 and 0.5μm and said fifth distance is between about 0.1 and 0.5μm.

76. (previously presented) The method according to Claim 71 wherein said first slot portion has dimensions of between about 0.1 and 0.5μm by between about 0.5 and 1.0μm, said second slot portion has dimensions of between about 0.1 and 0.5μm by between about 0.5 and 1.0μm, and said third slot portion has dimensions of between about 0.1 and 0.5μm by between about 0.9 and 1.5μm.

77. (previously presented) The method according to Claim 70 wherein said first and second copper lines have a width of more than about 0.2μm.

78 - 87. (canceled)

Amendments to the Drawings

The attached sheet of drawings includes changes to Fig. 1a and replaces the previously presented drawing sheet of Fig. 1a and Fig. 1b. The two close-together vias 41 have been removed from the drawing figure to revert to the original drawing Fig. 1a. This change has been made since the Examiner has found the reference to the close-together vias 41 in the Specification to be new matter.

Attachment: Proposed replacement sheet